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EVALUATION OF THE SOUTHERN PINE
BEETLE INFESTATIONS ON THE
CROSSETT EXPERIMENTAL FOREST, ARKANSAS

by

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INTRODUCTION

An aerial photographic survey and subsequent ground examinations were conducted on the Crossett Experimental Forest (Fig. 1) during August and September 1974. The survey, which covered 1680 acres, was conducted by personnel of the Forest Pest Management Group and William H. Hoffard and David Harrison of the Arkansas Forestry Commission to determine the current status of southern pine beetle populations on this unit.

METHODS

A 31 percent aerial photographic survey was conducted in accordance with Southeastern Area guidelines^{1/} for the purpose of evaluating southern pine beetle infestations on the Forest.

A portion of the spots detected aerially was examined on the ground to determine the cause of tree mortality, to evaluate the stage of beetle development and to assess the general condition of the beetle populations.

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis*, Zimm.

Hosts - The southern pine beetle will attack all species of southern yellow pine. However, loblolly pine, *Pinus taeda* L., and shortleaf pine, *P. echinata* Mill., are the preferred hosts.

^{1/} Detection of Forest Pests in the Southeast, 1970, USDA, USFS, SA, S&PF, Div. of FPM, Pub. S&PF-7, Atlanta, Ga. 51 pp.

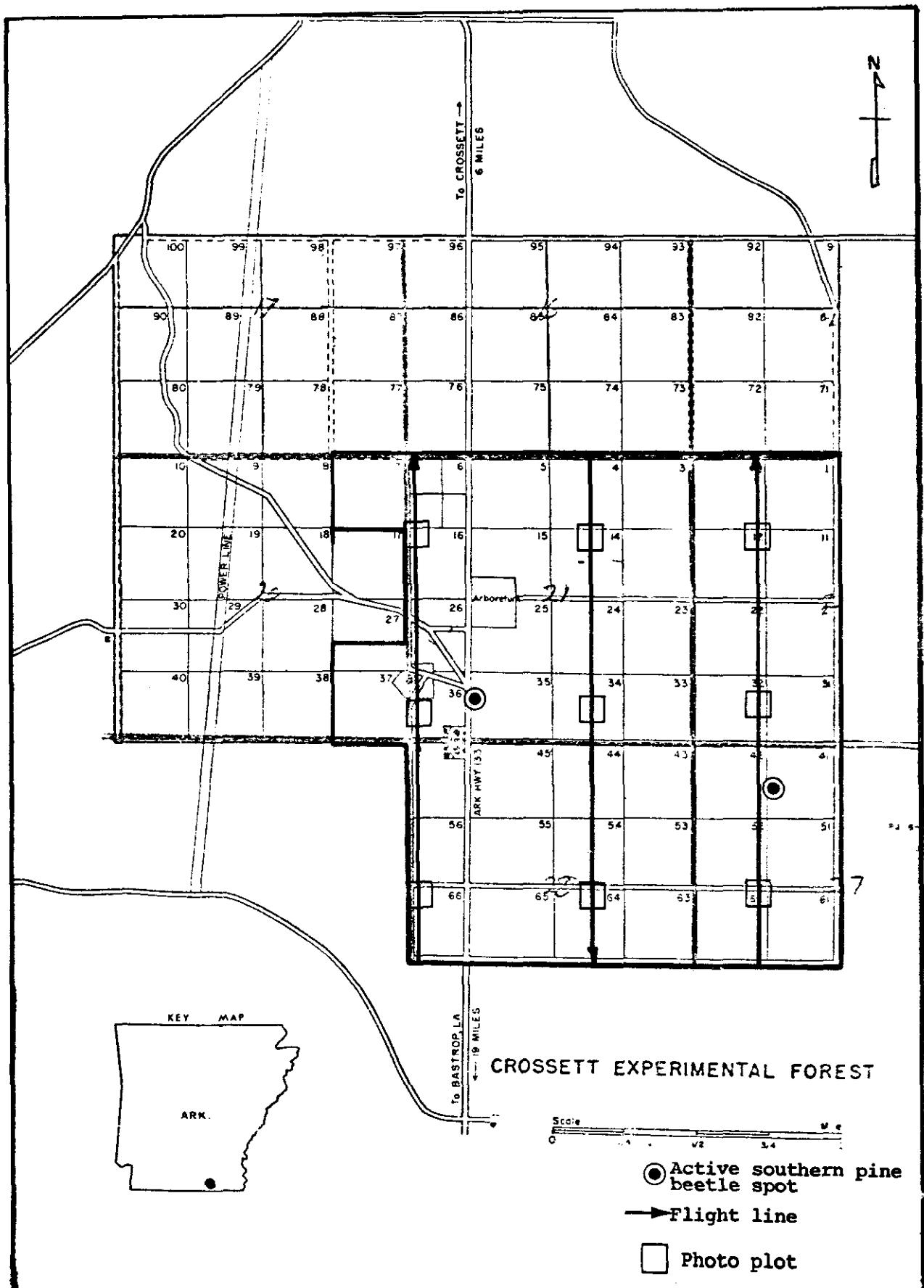


Figure 1. Map of the Crossett Experimental Forest, Arkansas, August 1974.

Type of Damage - Death of the tree is the result of cambial mining by the southern pine beetle as it constructs its gallery. The beetle also introduces the blue stain fungi, *Ceratocystis* spp., which hastens the death of trees.

Life cycle of the beetle - The beetles attack in pairs and construct winding galleries in the cambial region. Eggs are deposited in niches along the sides of the galleries and hatch into whitish grubs. The grubs further mine the inner bark and then bore into the outer bark to construct pupal cells. When the pupal stage matures, it changes to an adult beetle which emerges through the bark. The complete life cycle takes about a month during the summer, and as many as seven generations may be produced in a year.

RESULTS AND DISCUSSION

The southern pine beetle population is currently at moderate (5.28 infested trees/M acres of host type) levels on the Crossett Experimental Forest. Results of the evaluation are summarized in Tables 1 and 2.

Although 28 percent of the spots ground checked were actively infested, none of the infested trees contained beetles in a stage of development suitable for brood density counts. General observations, nevertheless, showed considerable brood mortality. Many of the infested spots were initiated by lightning strikes and were small in size (1-3 dead trees).

Although infestation levels of the beetle are only moderate at the present time, there is a potential for increased activity to occur on the Experimental Forest in the near future. Additionally, since control is being conducted on adjacent private land, the Forest should consider initiating a control program in accordance with guidelines set forth in FSM 5250. Project training, as necessary, will be provided by the Forest Pest Management Group, Pineville, Louisiana, upon request.

Table 1.--Results of southern pine beetle evaluation on the Crossett Experimental Forest, Arkansas, August-September 1974.

1. Results compiled from data collected during the aerial phase of the evaluation

Survey Type	Photographic
Date of Survey	August 19, 1974
Percent Survey	31
Total Acreage Surveyed	1680
Total Susceptible Host Type Acreage	1630
Total Number of Spots Within Survey Boundary	35
Spots Per M Acres of Host Type	21.77
Average Spot Size (Trees)	1.27
Range of Spot Sizes (Trees)	1 - 4
Reds and Faders Per M Acres of Host Type	27.71

2. Results compiled from data collected during ground and aerial phases of the evaluation

Date of Ground Phase	September 4, 1974
Infested Trees Per M Acres Host Type	5.28
Total Number of Infested Trees	9
Total Number of Affected Trees	24
Brood Density (Brood Per Square Foot)	---
Infested Green to Infested Red Tree Ratio	0.0 : 1
Volume of Infested Sawtimber	2.08 MBF
Volume of Affected Sawtimber	4.9 MBF

Table 2.--Summary of aerial survey data. Southern pine beetle evaluation.
Crossett Experimental Forest, Arkansas, September 1974

	INFESTATION SIZE (NO. OF TREES)						Average Multiple Tree Spot Size
	Single	2-5	6-20	21-50	51-100	100+	
Spots	32	3	0	0	0	0	35 4.00
Trees	32	13	0	0	0	0	45